UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

Refer to:
2002/00375

July 17, 2002

Ms. Nancy Weintraub
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation for the Longley Meadows Restoration Project, Upper Grande Ronde River Subbasin, Union County, Oregon.

Dear Ms. Weintraub:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Longley Meadows Restoration Project in Union County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Snake River (SR) steelhead *(Oncorhynchus mykiss)* or SR spring/summer chinook salmon *(O. tshawytcha)*, or destroy or adversely modify designated critical habitat. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This Opinion also serves as consultation on essential fish habitat for chinook salmon under Public Law 104-267, the Sustainable Fisheries Act of 1996, as it amended the Magnuson-Stevens Fishery Conservation and Management Act.

If you have any questions regarding this consultation, please contact Catherine Broyles of my staff in the Oregon Habitat Branch at 541.975.1835 ext. 223.

Sincerely,

for Michael R Course

D. Robert Lohn
Acting Regional Administrator

cc: Mark Roberston (USFWS)
Allen Childs (CTUIR)
Vance McGowan (ODFW)

Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Longley Meadows Restoration Project
Union County, Oregon

Agency:	Bonneville Power Administration
Consultation Conducted By:	NOAA Fisheries, Northwest Region
Date Issued:	July 17, 2002
Issued by:	for Michael R Course D. Robert Lohn Regional Administrator
Refer to:	**2002/00375**

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1. ENDANGERED SPECIES ACT

1.1 Background

On April 16, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a letter dated April 11, 2002, with an attached biological assessment (BA), from the Bonneville Power Administration (BPA) requesting Endangered Species Act (ESA) section 7 formal consultation regarding the potential effects of the actions associated with the Longley Meadows Restoration Project on Snake River (SR) steelhead and SR spring/summer chinook salmon and their designated critical habitat. The action area is located on the privately-owned Alta Cuhna River Ranch within the Upper Grande Ronde River (UGRR) Drainage, in the upper portion of the UGRR Subbasin (USGS HUC 17060104), Sections 14 and 15 of Township 3 South, Range 36 east. The project encompasses approximately one mile of the mainstem of the Grande Ronde River, one mile of Bear Creek, and 1.25 miles of Jordan Creek. The section of the Grande Ronde River included in the action area is flanked to the east by its confluence with Jordan Creek, and to the west by its confluence with Bear Creek. This project is funded by the BPA and administered by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) with technical assistance from the Oregon Department of Fish and Wildlife (ODFW) and the National Resource Conservation Service (NRCS).

The BPA has determined that SR steelhead and SR spring/summer chinook salmon may occur within the project area. The SR steelhead were listed as threatened on August 18, 1997, (62 FR43937) and SR spring/summer chinook salmon were listed as threatened on April 22, 1992, (57 FR 14653). Protective regulations for SR steelhead were issued under section 4(d) of the ESA on July 10, 2000, (65 FR 42422). The proposed project is within critical habitat for SR spring/summer chinook salmon, designated on December 28, 1993, (58 FR 68543).

This Opinion reflects the results of the consultation process which included a site visit on November 19, 2001, follow up correspondence, and discussions to clarify information provided in the BA, which are all included herein as reference. The purpose of this Opinion is to determine whether the actions involved in the Longley Meadows Restoration Project in Union County are likely to jeopardize the continued existence of SR steelhead, SR spring/summer chinook salmon, or result in the destruction or the adverse modification of the SR spring/summer chinook salmon critical habitat.

1.2 Proposed Action

This Opinion addresses the actions associated with the Longley Meadows Restoration Project. The overall objective of the project is to restore the natural character and function of the Longley Meadow wetland complex. An aggressive approach for project implementation is planned due to critically low numbers of wild chinook salmon and steelhead in the Grande Ronde River Subbasin and the potential value of the habitat in Longley Meadows. Implementation of specific actions are designed to create immediate improvements in instream habitat conditions and to accelerate natural successional development. Project activities involve the construction of one

mile of restoration channel of the lower reach of Bear Creek; diversion of Bear Creek from its current channelized reach; development of riparian conservation easements with private landowners along the mainstem of the Grande Ronde River, Bear Creek, and Jordan Creek to protect habitat developments from livestock; construction of riparian easement boundary fences; instream placement of large woody debris; and tree and shrub planting. Project activities are planned for implementation beginning July 1, 2002. Project completion is scheduled for October 15, 2003.

1.2.1 Restoration Channel Construction on Bear Creek

Approximately 9,000 feet of channel will be constructed in the historic floodplain of Bear Creek. The newly constructed channel will commence at the confluence of Bear Creek and the Grande Ronde River and run parallel to the east bank of the existing channelized reach. A detailed map found on page 13 of the BA depicts the location of the restoration channel in relation to the existing channel. Morphological characteristics for the existing channel, proposed channel, and reference reach are summarized in Table 1.

Table 1. Morphological Characteristics for the Existing and Proposed Channels with Reference Reach Data

VARIABLES	EXISTING CHANNEL	PROPOSED REACH	REFERENCE REACH
Rosgen Stream Type	F4	C4/E4	C4
Drainage Area (square miles)	7.8	7.8	7.8
Bankfull Width (feet) (wbkf)	20.0	11.0	13.2
Bankfull Mean Depth (feet) (dbkf)	0.50	0.84	0.69
Width/Depth Ratio (wbkf/dbkf)	40.00	13.16	19.10
Bankfull Cross-sectional Area (ft^2) (abkf)	10.00	9.20	9.12
Bankfull Mean Velocity (vbkf)	4.20	4.50	4.53
Bankfull Discharge (cubic feet per second)	42.0	41.4	41.3
Bankfull Maximum Depth (dmax)	0.6	1.2	1.46
Maximum driff/dbkf ratio	1.20	1.44	2.11
Low Bank Height to Maximum dbkf Ratio	>2	1.1	1.12
Width of Flood Prone Area (wfpa)	25	50	46.9
Entrenchment Ratio (wfpa/wbkf)	1.25	4.55	3.55
Meander Length (lm)	N/A channelized	126.5	131

Ratio of Meander Length to Bankfull Width (lm/wbkf)	N/A channelized	11.5	9.9
Radius of Curvature (rc)	N/A channelized	33	31.9
Radius of Curvature to Bankfull Width (rc/wbkf)	N/A channelized	3.00	2.42
Belt Width (wblt)	N/A channelized	132	134
Meander Width Ratio (wblt/wbkf)	N/A channelized	12	10.1
Sinousity (stream length/valley distance) (k)	1.04	2.00	1.78
Valley Slope (ft/ft)	0.0112	0.0112	0.0147
Average Slope (savg.)=(svalley/k)	0.0108	0.0052	0.0083
Pool Slope (spool)	0.0007	0.0013	0.0013
Ratio of Pool Slope to Average Slope (spool/sbkf)	0.06	0.25	0.15
Maximum Pool Depth (dpool)		2.5	2.10
Ratio of Pool Depth to Average Bankfull Depth (dpool/dbkf)		3	1.52
Pool Width (wpool)		16.5	15.5
Ratio of Pool Width to Bankfull Width (wpool/ wbkf)		1.50	1.17
Ratio of Pool Area to Bankfull Area		2.40	1.79
Pool to Pool Spacing (p-p)	N/A channelized	63	66
Ratio of p-p Spacing to Bankfull Width (p-p/wbkf)		6.0	5.0
Riffle Slope (Sriff)		0.0091	0.0197
Ratio of Riffle Slope to Average Slope (sriff/sbkf)		1.75	2.4
Ratio of Riffle Slope to Average Slope (sriff/sbkf)		1.2	1.5
Maximum Riffle Slope to Average Depth (driff/dbkf)		1.4	2.113

* *channel sinousity=(k)*
* *water surface slope=(s)*

Actions involved in channel construction include: (1) Excavation of soil and gravel; (2) shaping point bars; (3) cutting and shaping outside meanders, riffle/channel cross-over sections, and

channel thalweg; and (4) shaping terraces and/or streambank slope at a 3:1 ratio. An estimated 10,000 cubic yards (cy) of material will be excavated from the restoration channel. Excavated material will be loaded and hauled in dump trucks to a designated stock-pile location for installation in the abandoned stream reach.

1.2.2 Fish Salvage Operations and Channel Diversion for Bear Creek

Fish salvage operations will be initiated in 2002, during the latter part of the ODFW in-water work window (July 1-October 15). Elevated water temperatures during this time period will limit the number of juvenile salmonids in the project area. Prior to trapping fish, ODFW and CTUIR crews will conduct population surveys to assess population numbers in the project area. Three 50-meter index sites will be surveyed within the 5,000-foot stream reach. Data provided through this effort will allow biologists to assess the magnitude of effort and setup requirements for the trap-and-haul efforts. Following completion of index site surveys, ODFW/CTUIR crews will initiate trap-and-haul efforts along the entire 5,000-foot reach until all fish have been relocated.

The upper and lower reaches of the project area will be block-netted to prevent movement of fish into the restoration reach. Seine nets will be used where possible to capture and remove fish. A Smith-Root Model 12A POW electroshocker will be used to capture the remaining fish. Accepted protocols and methods as are described in the NOAA Fisheries Backpack Electrofishing Guidelines included as Appendix A of this Opinion, and will be implemented. Fish transport will be conducted using two All Terrain Vehicles (ATVs) with integrated utility beds for secured storage of the aerated coolers that will be used to hold the fish during transport. Water temperatures will be monitored continuously to ensure that fish avoid thermal stress during transport. All fish salvaged from the channel will be relocated to designated sections upstream of the area being dewatered.

Following completion of initial trap-and-haul efforts, Bear Creek will be diverted into the restoration channel. Diversions will be accomplished by initially constructing a small, earthen plug to divert water in to the restoration channel, followed by complete installation of earthen plugs and rootwad revetments. As soon as the diversion structure is constructed and Bear Creek is diverted into the restoration channel, ODFW and CTUIR crews will continue with trap-and-haul operations in the abandoned reaches of the stream to salvage any remaining fish that were not captured during initial efforts. If necessary, staff will snorkel in the abandoned channel to determine whether any fish remain. If fish are found, they will be relocated to designated areas.

1.2.3 Reclamation Activities in the Abandoned Channel

Following the removal of fish and the completion of the channel diversion, reclamation activities in the abandoned channel will be initiated. Channel reclamation is planned for completion during October 2003. Based on cut/fill calculations, designed channel dimensions, and cross-sectional measurements of the channelized reach, it is anticipated that the amount of material excavated from the restoration channel will be sufficient to fill approximately 90% of the

abandoned channel. An estimated 10,000 cy of material will be used to fill in the upper portion of the channelized reach by constructing compacted earthen plugs and blended terraces. Compaction of fill material will be accomplished by back-filling 12- to 16-inch layers with heavy equipment over individual lifts. Floodplain ponds will be constructed in the lower portion of the reclamation reach near the confluence with the Grande Ronde River. The Oregon Department of Transportation (ODOT) has selected this portion of Longley Meadows to fulfill wetland mitigation obligations associated with new bridge construction near Perry, Oregon along the Grande Ronde River. ODOT will provide cost-share funding to develop approximately one acre of shrub/scrub wetland. Wetland development will be protected under the Conservation Reserve Enhancement Program (CREP) easement.

Floodplain ponds and wetlands will be shaped into oxbows and meanders with dozers and track-mounted excavators to develop macrotopic basins. Pond location and shape will take advantage of existing channel swells where possible in order to minimize equipment operations and maximize integration of existing native floodplain/hydrophytic vegetation such as rushes, sedges, and willows. Both shallow and deep water habitat will provide perennial potholes/ponds and habitat for fish that could potentially enter the floodplain ponds. Blended terraces will be utilized to control floodplain flood flow and to minimize entrance into reclaimed channelized reaches. Terraces will be constructed with an elevation approximately one foot higher than the surrounding floodplain, and will consist of compact fill material. Terraces will develop into upland inclusion with appropriate native grassland communities.

1.2.4 Riparian Conservation Easement Fence Construction

A conservation easement on the Alta Cuhna River Ranch along the mainstem Grande Ronde River, Bear Creek, and Jordan Creek has been secured through a combination of BPA and CREP funds. Conservation easements along the Grande Ronde and lower portions of Bear and Jordan Creek downstream of Highway 244, and along Bear Creek upstream of Highway 244 will be included under CREP. A BPA fish habitat easement will be secured along Jordan Creek upstream of Highway 244. Table 2 lists the stream reaches and acreage included under the easement programs.

Table 2. Conservation Easements

STREAM REACH	EASEMENT PROGRAM	EASEMENT ACREAGE	STREAM LENGTH (miles)
Mainstem Grande Ronde River (GRR), Bear Creek, Jordan Creek, unnamed tributary downstream of Highway 244	CREP	176	GRR-0.06 Bear Creek-0.48 Jordan Creek-0.31 Tributary-0.61
Bear Creek (upstream of Highway 244)	CREP	40	1.21
Jordan Creek (upstream of Highway 244)	CTUIR/ODFW BPA	68	1.04

Under the CREP easements, the landowner will receive annual payments on a per-acre basis for a 10- to 15-year period in return for refraining from livestock grazing. The NRCS is responsible for securing the agreement with the private landowner. NRCS, CTUIR, and ODFW will coordinate with the private landowner for various habitat restoration and enhancement actions within the CREP easement boundaries. These projects will be designed, implemented, and consulted on as funds become available in upcoming years. A 15-year BPA fish habitat easement, consisting of approximately 68 acres along Jordan Creek, upstream of Highway 244, has been secured. Livestock grazing will be prohibited during the easement period. Funding for improvements/enhancements has been secured by CTUIR and ODFW through internal programs, through the Grande Ronde Model Watershed.

1.2.5 Large Woody Debris Additions to Upper Bear and Jordan Creeks

Instream habitat will be enhanced by placing large woody debris and whole trees with rootwads in the restored channel of Bear Creek and the existing channel of Jordan Creek in order to create complex adult holding and juvenile rearing pools. The majority of large woody debris placement will occur within the Jordan Creek stream reach upstream of Highway 244. As whole trees become available, they will be placed in Bear Creek upstream of Highway 244. Wood placement will mimic natural recruitment processes in riparian meadow ecosystems.

1.2.6 Riparian Tree and Shrub Planting

A combination of tree and shrub planting techniques will be used along the various stream reaches included within the action area in an attempt to accelerate vegetative recovery. Specific sites targeted for planting are indicated on the map found on page 13 of the BA. Approximately 5,000 Ponderosa pine seedlings, 1,000 riparian shrubs (willow, dogwood, and alder), and 1,500 live-whip bundles will be planted with either a stinger or handtools. Areas disturbed during construction activities will be seeded with native grasses.

1.3 Biological Information and Critical Habitat

The listing status and critical habitat designation of SR spring/summer chinook salmon and SR steelhead are outlined in section 1.4 of this Opinion. Biological information for SR steelhead is found in Busby *et al.* (1996) and that for SR spring/summer chinook salmon in Mathews and Waples (1991) and is summarized in Myers *et al.* (1998).

The proposed actions discussed within this Opinion are within designated critical habitat for SR spring/summer chinook salmon. Critical habitat for SR spring/summer chinook salmon was designated on December 28, 1993, (58 FR 68543). Critical habitat for SR chinook salmon encompasses the major Columbia River tributaries known to support this ESU, including the Salmon, Grande Ronde, Imnaha, Deschutes, John Day, Klickitat, Umatilla, Walla Walla, and Yakima Rivers, as well as the Columbia River and estuary. Critical habitat consists of all waterways below long-standing (more than 100 years duration) naturally-impassable barriers, and therefore includes the Longley Meadows project area. The riparian zone adjacent to these waterways is also considered critical habitat. This zone is defined as the area that provides the following functions: Shade, sediment, nutrient/chemical regulation, stream bank stability, and input of large woody debris/organic matter.

Essential features of the adult spawning, juvenile rearing, and adult migratory habitat for the SR steelhead and chinook salmon are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. The essential features that the project may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

1.4 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

Furthermore, NOAA Fisheries evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. NOAA Fisheries must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. NOAA Fisheries identifies those effects of the action that impair the function of any essential element of critical habitat. NOAA Fisheries then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NOAA Fisheries concludes that the proposed action will destroy or adversely modify critical habitat it must identify any reasonable and prudent alternatives available.

For the proposed action, NOAA Fisheries' analysis considers direct or indirect mortality of fish attributable to the action. NOAA Fisheries' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for juvenile and adult migration, spawning, and rearing of the SR spring/summer chinook salmon under the existing environmental baseline.

1.4.1. Biological Requirements

The first step the NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon and steelhead is to define the species' biological requirements that are most relevant. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list SR salmon and steelhead for ESA protection, and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for SR spring/summer chinook salmon and SR steelhead to survive and recover to naturally reproducing population levels at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning and rearing. SR spring/summer chinook salmon and SR steelhead survival in the wild depends upon the proper function of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse impact of current practices. In conducting analysis of habitat altering actions and essential habitat elements, NOAA Fisheries defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and utilized a "habitat approach" to its analysis (NMFS 1999).

1.4.2 Environmental Baseline

The current status of SR spring/summer chinook salmon ESU has improved somewhat since being listed as threatened in 1992. In 1994, the species was proposed for listing as endangered due to very low numbers of adults observed at Lower Granite Dam on the lower SR. However, an improvement in the adult return levels as seen in 1997, promoted the withdrawal of the proposed listing status change in1998. Recent returns show continuing improvements in adult returns, at least for some portions of the ESU. The counts at Lower Granite Dam for spring/summer chinook salmon were 14,320 in 1998, 6,556 in 1999, 37,755 in 2000, and 18,972 in 2001 (http://www.nwp.usace. army.mil/op/fishdata/lwrgrant.htm). Lower Granite Dam is located at river mile (RM) 107.5 on the mainstem of the Snake River, about 70 miles below (downstream of) the confluence with the Grande Ronde River with the Snake River.

The current range-wide status of the identified ESUs may be found in Busby *et al.* (1996) and Myers *et al.* (1998). The proposed action will occur within the range of SR steelhead and SR spring/summer chinook salmon. The defined action area is the area that is directly and indirectly affected by the proposed action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed, where actions described in this Opinion lead to additional activities, or affect ecological functions, contributing to stream degradation. As such, the action area for the proposed activities include the immediate portions of the watershed containing the project, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the 1 mile of Bear Creek, 1.25 miles of Jordan Creek, and 1 mile of the mainstem of the Grande Ronde River as well the surrounding riparian and stream areas that will be impacted by the construction activities.

Longley Meadows is located along a unique, low gradient section of the upper Grande Ronde River at RM 175 along historic alluvial fans of the Grande Ronde River and Bear and Jordan Creek. Low gradient sections in the Grande Ronde River between La Grande and Meadow Creek are limited and provide morphological characteristics important in the formation of diverse aquatic habitat. Longley Meadows historically provided pasturine emergent wetlands and backwater habitat associated with the Grande Ronde River, Bear Creek, and Jordan Creek.

Both Jordan and Bear Creek are known to have historically provided spawning and rearing habitat for SR steelhead. Very little is known about SR spring/summer chinook salmon use in these tributaries. However, in December 1999, ODFW and CTUIR personnel observed juvenile SR spring/summer chinook salmon near the mouth of Bear Creek, indicating that these tributaries may support juvenile SR spring/summer chinook salmon winter habitat as well. Bear and Jordan Creeks provide spawning and rearing habitat for SR steelhead.

Instream conditions are considered fair-to-poor based on observational surveys conducted by CTUIR and ODFW project biologists. Impacts of past management activities such as

channelization, road construction, railroad construction, livestock grazing, farming and logging have left the project reaches functioning well below levels that promote healthy salmonid populations and watershed health. Jordan Creek suffers from high summer water temperatures, winter icing, and unstable streambanks. There is currently a good overstory of maturing cottonwoods and conifers, but the vegetation component lacks recruitment of understory trees and shrubs. Instream habitat diversity is fair, but lacks large woody debris and complex pool habitat. Only three pieces of large wood were seen in the 1.3 mile reach.

Bear Creek suffers from problems similar to Jordan Creek, but is in worse condition. In the reach upstream of Highway 244, the large overstory tree (conifer/hardwood) component is mostly absent. The understory component, comprised of hardwood trees and shrubs, has been heavily impacted by grazing. Bank erosion is excessive, and existing stream morphology conditions such as width/depth ratio and sinuosity are below potential for the reach. The reach downstream of Highway 244 to the confluence with the Grande Ronde River remains in poor condition due to its channelized configuration. Fish passage in the lower portions of Bear Creek is seasonally blocked during summer baseflow due to existing log weir structures installed in the mid 1990's. Once the channelized reach of Bear Creek containing these weirs is abandoned and flows are diverted into the newly constructed channel, the weirs will no longer pose a fish passage problem.

CTUIR and ODFW conducted limited maintenance and structural modifications to the existing log weirs in November 2000, to address fish passage. Efforts included notching individual weirs and installing geofabric on weir faces in order to elevate surface water elevations and attempt to provide fish passage in the short term. Initial assessment indicates that improving fish passage in the short term was marginally successful. During summer baseflow period, the existing structures continue to prevent fish passage.

Based on the best available information on the current status of SR steelhead and SR spring/ summer chinook salmon range-wide; the population status, trends, and genetics; and the poor environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of the identified ESU within the action area are not currently being met. Numbers of steelhead and chinook salmon are substantially below historic numbers. Recovery trends show no clear pattern due to lack of long-term data. Degraded freshwater habitat conditions, which include the effects of agricultural and residential use, have contributed to the decline. The NOAA Fisheries Matrix of Pathways and Indicators (MPI) was used in the BA to assess the current condition of various steelhead and chinook salmon habitat parameters. Use of the MPI identified the following habitat indicators as either at risk or not properly functioning within the action area: Temperature, sediment, substrate, large woody debris, pool frequency, pool quality, off-channel habitat, width/depth ratio, streambank condition, floodplain connectivity, peak/base flows, road density, road location, disturbance history, and riparian reserves. Actions that do not maintain or restore properly functioning aquatic habitat conditions have the potential to jeopardize the continued existence of SR steelhead and SR spring/summer chinook salmon.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Actions

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. This process is described in the document, *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The effects of proposed actions are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat factors in the project area. For the proposed actions, all conditions within the project area will be improved with the exception of chemical contaminants/nutrients, physical barriers, and peak/base flows. These three indicators will be maintained. The first indicator, chemical contaminants/nutrients is currently rated as properly functioning, while the second and third are currently rated as not properly functioning.

Impacts of the proposed project to stream habitat and fish populations can be separated into direct and indirect affects. Direct effects are those that contribute to the immediate loss or harm to individual fish or embryos (*e.g.,* heavy equipment directly crushing a fish, crushing or destabilizing a redd that results in the actual destruction of embryos, dislodging the embryos from the protective nest and ultimately destroying eggs).

Indirect effects are those impacts which occur at a later time, causing specific habitat features (*e.g.,* undercut banks, sedimentation of spawning beds, loss of pools), localized reductions in habitat quality (*e.g.*, sedimentation, loss of riparian vegetation, changes in channel stability and structure), and which ultimately cause loss or reduction of populations of fish, or reductions in habitat quantity and/or quality.

In the short term, implementation of the actions associated with the project could adversely affect SR steelhead and SR spring/summer chinook salmon and their critical habitat in the following ways:

<u>Elevated Turbidity and Sediment Levels</u>
A flood event during or soon after channel construction could result in failure of the new channel with sediment releases extending well beyond the project area. If channel failure due to a flood event occurs, the restored historic flat gradient with the extensive available floodplain of Longley Meadows will minimize increases in sedimentation downstream from the action area will be minimized. The potential for channel failure and/or the restoration channel recapturing the abandoned channel has also been minimized by project design features including channel form and dimension, streambed elevation control at the lower end of the restoration reach, and abandoned channel reclamation measures such as earthen plugs, blended terraces, and floodplain ponds.

There will be a temporary increase in turbidity and redistribution of fine sediment when Bear Creek is diverted into the restoration channel. Project activities will be conducted during the

instream work window and will therefore avoid any potential impact to spawning adults, redds, or alevins. The restoration channel with its designed form in conjunction with diverse channel features such as pools and riffles, along with the low gradient floodplain will sort suspended sediment and bedload more efficiently and, as such, will be resilient to increases in sediment and turbidity. In addition, since channel construction in 2000, vegetative recovery has been moderate, with substantial development of native rushes and sedge communities. Vegetative recovery will help mitigate the duration and intensity of increases in sedimentation and turbidity.

Fish Salvage Operations

Juvenile salmonids could be adversely affected by trap-and-haul operations. ODFW and CTUIR crews will conduct trap-and-haul prior to channel diversion, and follow up with additional electrofishing/seining/dip netting as necessary as the existing channel is dewatered to capture and relocate any remaining fish. Electrofishing, netting, and handling increase the risks of injury or stress-related mortality to juvenile salmonids. Measures outlined in the BA will help ensure that potential adverse effects are minimized.

Floodplain Ponds

The potential for fish to become trapped in floodplain ponds associated with the abandoned channel during flood flow events is minimized by several measures incorporated into the design. The construction of blended terraces in the lower meadow to prevent the majority of flood flows from entering the abandoned stream reach and floodplain pond network is one such measure. Availability of the material will dictate the volume of the channel that will be filled and the size of blended terraces. The intent is to maximize the amount of floodplain available for Bear Creek to interact with, not constrain it, as has been the current condition since the mid-1960s. As such, terraces would be developed as close as possible to the floodplain pond network. The concept of the design is to mimic natural floodplains with associated old meander oxbows and cut-off channels that would be interconnected during periods of flood flows. The lower end of the network will be interconnected to the mainstem of the Grande Ronde River.

Fish that are swept or swim onto the floodplain during flood events, a naturally-occurring event in meadow ecosystems, would be expected to search out deeper water in swales and historic channels and eventually navigate back into the stream network. Based on the life history of anadromous fish, it can be predicted that juvenile salmonid within the project area during spring flow events will not be searching out long-term holding water, but rather initiating their migration to the Pacific Ocean. Juvenile salmonids would therefore, likely key in on downstream surface currents and follow gradual drawdown of the peak in the hydrograph. In the event that juvenile fish do become trapped in floodplain ponds developed as a part of this restoration project, sufficient deep-water habitat within the ponds and perennial water will be available to support salmonids during the summer until peak flow events occur again during the following season.

Potential Loss of Perennial Streamflow

Because the summer base flow of Bear Creek is small (1-3 cubic feet per second), there is the possibility that flows may go subsurface if the new channel is not adequately sealed.

Groundwater well data indicates that groundwater elevations are within 3-5 feet of the surface elevation of the meadow. The reconstructed channel for Bear Creek will be excavated to the depth of existing groundwater. This will ensure that the channel is connected to the groundwater and consequently will minimize the potential for the channel dewatering. In the event that a given stream section is inadequately sealed, the area of subsurface flow will likely be minimal. Fish should be able to avoid that portion of the stream by moving either upstream or downstream until matting can be installed to harden the site.

In the long term, actions associated with the project will increase channel length and the availability of suitable habitat; enhance instream habitat diversity and complexity; restore natural channel morphology and floodplain function; reduce streambank erosion and sediment transport; enhance the availability of backwater habitat for winter rearing; and improve water quality. Consequently, NOAA Fisheries does not expect theat the effects of this action will diminish the long-term value of the habitat for the survival of SR steelhead and SR spring/summer chinook salmon.

1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." NOAA Fisheries is not aware of any significant change in non-federal activities that are reasonably certain to occur within the action area. NOAA Fisheries assumes that future private and state actions will continue at similar intensities as in recent years.

1.6 Conclusion

NOAA Fisheries has determined that, when the effects of the subject actions addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of SR spring/summer chinook salmon or SR steelhead. Additionally, the NOAA Fisheries concludes that the subject actions would not cause adverse modification or destruction of designated critical habitat for SR spring/summer chinook salmon, however, NOAA Fisheries believes that the proposed action will cause some minor short-term increases in stream turbidity and sedimentation rates in Jordan Creek, the Grande Ronde River, and Bear Creek. These conclusions were reached because the actions will result in long-term improvements in fish passage, the condition of riparian vegetation, stream shading, substrate embeddedness, and streambank stability, thereby improving instream habitat by increasing the amount of large woody debris in the channel and increasing pool frequency and quality in Longley Creek. Thus, the proposed action is not expected to impair properly functioning habitats, appreciably reduce the functioning of already impaired
habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU level.

1.7 Conservation Recommendations

Section 7 (a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of proposed actions on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NOAA Fisheries has no additional conservation recommendations regarding the action addressed in this Opinion.

1.8 Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). To reinitiate consultation, BPA must contact the Habitat Conservation Division (Oregon Habitat Branch) of NOAA Fisheries, and refer to 2002/00375.

2. INCIDENTAL TAKE STATEMENT

Sections 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement. An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the proposed action is reasonably certain to result in the incidental take of listed species in this Opinion because of detrimental effects from increased sediment levels (non-lethal) and the potential for incidental take during in-water work (lethal and

non-lethal). Based on information in the BA, NOAA Fisheries anticipates that a minor amount of direct take from fish salvage operations (up to 100 juvenile SR steelhead or SR spring/summer chinook salmon) could result from the fish salvage operations covered in this Opinion. Effects of all other actions covered by this Opinion are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on habitat or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to these actions as are covered in this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, the NOAA Fisheries designates the expected level of take as "unquantifiable".

2.2 Reasonable and Prudent Measures

In this Opinion, the NOAA Fisheries has determined that the level of anticipated take is not likely to jeopardize SR steelhead, SR spring/summer chinook salmon, or to destroy or adversely modify designated SR spring/summer chinook salmon critical habitat when the following reasonable and prudent measures are implemented:

1. To minimize the amount and extent of incidental take from in-water construction activities, measures shall be taken to limit the duration and extent of in-water work, and to time such work when the impacts to SR chinook salmon and SR steelhead are minimized.

2. To minimize the amount and extent of incidental take from construction activities in or near the creeks, effective erosion and pollution control measures shall be developed and implemented throughout the area of disturbance. The measures shall minimize the movement of soils and sediment both into and within the river, and will stabilize bare soil over both the short term and long term.

3. To minimize the amount and extent of take from loss of instream habitat and to minimize impacts to critical habitat, measures shall be taken to minimize impacts to riparian and in stream habitat, or where impacts are unavoidable, to replace or restore lost riparian and in stream function.

4. Minimize the likelihood of incidental take that may occur during the fish salvage (trap-and-haul) operations.

5. To ensure effectiveness of implementation of the project design, all erosion control measures and planting for site restoration shall be monitored and evaluated both during and following construction, and meet criteria as described below in the terms and conditions.

2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the BPA must comply with the following terms and conditions, which will implement the reasonable and prudent measures described above. These terms and conditions should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed. Implementation of the terms and conditions within this Opinion will further reduce the risk of impacts to fish habitat. These terms and conditions are non-discretionary.

1. To implement Reasonable and Prudent Measure #1 (in-water work), the BPA shall ensure that:
   a. Project Design. The following overall design conditions are met:
      i. Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project. As much work as possible proposed for below the ordinary high water line will be completed during low flow periods and in the dry.
      ii. In-water work. All work within the active channel will be completed within the ODFW approved in-water work period for this area, July1 through October 15. Extensions of the in-water work period, including those for work outside the wetted perimeter or the stream but below the ordinary high water mark, must be approved by biologists from NOAA Fisheries

2. To implement Reasonable and Prudent Measure #2 (erosion and pollution control measures), the BPA shall ensure that:
   a. Isolation of in-water work area. The work area will be well isolated from the active flowing stream to minimize the potential for sediment entrainment. Sediment levels will be monitored to ensure compliance with state water quality standards. All project operations, except efforts to minimize sedimentation, will cease if sediment levels exceed state water quality standards.
   b. Pollution and erosion control plan. A Pollution and Erosion Control Plan (PECP) will be developed to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:
      i. Methods that will be used to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, equipment and material storage sites, fueling operations and staging areas.
      ii. Methods that will be used to confine and remove and dispose of excess concrete, cement, and other mortars or bonding agents, including measures for washout facilities.
      iii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.
      iv. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed

methods for disposal of spilled materials, and employee training for spill containment.

v. Measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.

vi. Equipment that is used for work shall be cleaned prior to entering the job site. External oil and grease shall be removed, along with dirt and mud. Untreated wash and rinse water will not be discharged into construction area without adequate treatment. Areas for fuel storage and servicing of construction equipment and vehicles will be located at least 300 feet away from any body of water.

vii. The contractor shall develop and implement a site-specific spill prevention, containment, and control plan (SPCCP) that includes notification procedures, and is responsible for containment and removal of any toxins released. The contractor will be monitored by the BPA to ensure compliance with the SPCCP.

viii. The person identified as the Erosion and Pollutant Control Manager (EPCM) shall also be responsible for the management of the contractors' SPCCP. In the event of a hazardous materials or petrochemicals spill, the EPCM shall be responsible for:

(1) Taking immediate action to recover toxic materials from further impacting aquatic or riparian resources

(2) Documenting a detailed description of the quantity, type, source, reason for the spill, and actions taken to recover materials.

(3) Notifying necessary state officials if a spill does occur.

(4) Ensuring that all refueling of equipment will take place 300 feet from any body of water and auxiliary fuel tanks will not be stored on bridges, roads or within the two-year flood plain.

(5) Inspecting all machinery for leaks prior to on-site use.

3. To implement reasonable and prudent measure #3 (riparian and instream functions), the BPA shall ensure that:

a. Construction activities will be done in a way which minimizes disturbance of existing riparian vegetation. Where disturbance is necessary, native vegetation will be clipped by hand where feasible so that roots remain intact. In all areas that require removal or involve mortality of riparian vegetation, reseeding and/or replanting of vegetation with native species will occur.

b. Existing vegetation conditions shall be monitored to ensure successful establishment.

c. Immediately implement re-vegetation procedures to replace any functional riparian components dying because of construction. Only native vegetation will be replanted. Soil erosion control fabric will be used in conjunction with seeding to reduce sedimentation releases for the disturbed areas.

d. The BPA shall monitor the success of planting within, and adjacent to, the construction area. The monitoring of any new planting should be done one year following construction and again at the third and the fifth year. The BPA will supply a report each year to the NOAA Fisheries that shall include photos of the planting in the project area.

e. Failed planting will be replaced yearly, for a period of five years.

4. To implement reasonable and prudent measure #4 (fish salvage operations), the BPA shall ensure that:

a. The fish salvage operation is conducted by qualified personnel familiar with and implementing NOAA Fisheries electrofishing or seining guidelines (Appendix A).

b. During electroshocking or seining, backpack electroshockers and other necessary equipment that meet NOAA Fisheries guidelines for use on ESA listed fish will be used. The number of passes through the stretch will be kept to a minimum.

c. No seining or electrofishing shall be conducted when water temperatures exceed 18˚ C. During periods of high water temperature, sampling shall occur early in the morning or in the evening before dark.

d. Surveyors shall observe the condition of sampled fish. If fish appear stressed or injured (dark bands, gulping air, excessive mucus, irregular swimming, or bucket predation), immediately halt sampling and decrease the frequency and voltage.

e. There shall be no fin clipping or use of anaesthetics on ESA listed salmonids.

f. Fish will be transported in aerated buckets or tanks to a safe, upstream area as soon as possible after capture.

g. If a listed fish is injured or killed at any point during the salvage operation, the NOAA Fisheries Law Enforcement Office will be contacted as described in section 5(c) below.

5. To implement reasonable and prudent measures #5 (monitoring and reporting), the BPA shall:

a. Submit a report to NOAA Fisheries within 120 days of completing the project. Describe the BPA's success meeting conservation recommendations above. Include the following information:

i. <u>Project identification</u>.

(1) Project name

(2) Starting and ending dates of work completed for this project

(3) BPA contact person.

ii. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

iii. <u>Site restoration</u>. Documentation of the following conditions:

(1) Finished grade slopes and elevations

(2) Planting composition and density

(3) A plan to inspect and, if necessary, replace failed plantings and structures for a period of three years

iv. A narrative assessment of the effects of the project.

v. Photographic documentation of environmental conditions at the project site before, during and after project completion.

(1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre- and post-construction.

(2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.

(3) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

b. Submit monitoring reports to:
National Marine Fisheries Service (NOAA Fisheries)
Oregon Habitat Branch, Habitat Conservation Division
Attn: 2002/00375
525 NE Oregon Street, Suite 500
Portland, Oregon 97232-2778

c. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the National Marine Fishery Service Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite130, Vancouver, Washington 98661 or call 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENS ACT

3.1 Background

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), requires the inclusion of EFH descriptions in federal fishery management plans. In addition, the MSA requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA Fisheries shall provide conservation recommendations for any federal or state activity that may adversely affect EFH;
- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and up slope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The PFMC has designated EFH for three species of Pacific salmon: Chinook salmon (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*)(PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and

longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). In estuaries and marine areas, designated salmon EFH extends from the near shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border. Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Actions

The proposed actions are detailed above in section 1.1. The action area includes Jordan Creek, the Grande Ronde River, and Bear Creek. This area has been designated as EFH for various life stages of chinook salmon.

3.5 Effects of Proposed Action

As described in detail in ESA portion of this consultation**,** the proposed activities may result in detrimental short-term adverse effects to a variety of habitat parameters.

3.6 Conclusion

NOAA Fisheries believes that the proposed action may adversely affect the EFH for chinook salmon.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the BPA, all of the Reasonable and Prudent Measures and the Terms and Conditions contained in sections 2.2 and 2.3 are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.8 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The BPA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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Appendix A. NOAA Fisheries Electrofishing Guidelines (NMFS 2000)

ELECTROFISHING GUIDELINES

Suggested protocol for the use of backpack electrofishing equipment in waters containing fish listed under the Endangered Species Act (ESA). These recommendations should be seen as guidelines for developing consistent and safe electrofishingtechnique. It is hoped that these guidelines will ultimately help improve electrofishing technique in ways which will reduce fish injury and increase electrofishing efficiency.

Purpose and Scope

The purpose of this document is to recommend guidelines for using backpack electrofishing equipment to sample ESA-listed fish. Because electrofishing can kill or severely injure fish, every effort should be made to avoid electrofishing and use snorkeling or other fishery information collection techniques. Where electrofishing is the only suitable sampling method, these guidelines are suggested to help reduce the number of fish killed or severely injured. These guidelines are concerned only with studies that involve electrofishing juvenile or adult salmonids that are *not* in spawning condition. Electrofishing in the vicinity of adults in spawning condition or operating equipment in the vicinity of redds containing developing eggs is not discussed as there is no justifiable basis for permitting these activities near listed species. Also, these guidelines do not deal with factors such as temperature or fish handling technique both of which can significantly affect fish health during an electrofishing session. None the less, all ESA-listed fish must be sampled with extreme care. The field crew must carefully design the sampling sessions to minimize fish stress by working within favorable temperature regimes, using anesthetics when necessary, and minimizing the time the fish are held before release. As with all fieldwork involving live ESA-listed fish, the best science should be used along with an experienced crew and good equipment in order to minimize handling stress.

Equipment

Equipment should be in good working condition. Operators should go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a log.

Training

A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment should train the crew. The crew leader’s experience must be documented and available for confirmation; such documentation may be in the form of a logbook. The training should occur before an inexperienced crew begins any electrofishing; it should also be conducted in waters that do not contain ESA-listed fish.

The training program must include the following elements:

1. Definitions of basic terminology: *e.g.,* galvanotaxis, narcosis, and tetany.

2. An explanation of how electrofishing attracts fish.

3. An explanation of how gear can injure fish and how to recognize signs of injury.

4. A review of these guidelines and the manufacturer's recommendations.

5. A demonstration of the proper use of electrofishing equipment, the role each crew member performs, and basic gear maintenance.

6. A field session where new individuals actually perform each role on the electrofishing crew.

Specific Electrofishing Guidelines

1. In order to avoid contact with spawning adults or active redds, carefully survey the area to be sampled before beginning electrofishing.

2. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

3. Only direct current (DC) should be used.

4. Each session should begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. *In general*, exceeding 40 Hz will injure more fish.

5. The zone of potential fish injury is 0.5m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

6. The stream segment should be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

7. Crew should carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling should be terminated if injuries occur or abnormally long recovery times persist.

8. When the sampling design involves taking scales and measurements, a healthy environment for the stressed fish must be provided and the holding time must be minimized. For these operations, additional crew members who are experienced in holding and processing stressed fish may be necessary.

9. Whenever possible, a block net should be placed below the area being sampled to capture stunned fish that may drift downstream.

10. The electrofishing settings should be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, together with observations on fish condition, will improve technique and form the basis for training new operators.